

ABSTRACT

The invention provides a sensor array with different nanodisk sensors that may be fabricated by direct site-specific dip-pen nanopatterning (DPN) using precursor inks. The good flow characteristics and strong affinity of the sols to measurement electrodes enable intimate
5 ohmic contact. The measurable, reproducible and proportionate changes in the resistance of the sensors when exposed to trace quantities of oxidative and reducing gases constitute the basis for nanodisk gas sensors. The nanodisk sensors show rapid response and ultra-fast recovery for the detection of nitrogen dioxide and acetic acid vapor. Based on the principles of pattern
recognition of the olfactory system, an electronic nose that can “smell” different gaseous species
10 is provided with the multiple nanodisk sensor array. These nanodisk sensors have gas recognition ability, instant response and rapid recovery, compact size and integration with the established microelectronics platform and are well-suited for the on-site and real-time detection of gases.